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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/753,397 | 01/03/2001 | Yushi Jinno | 2933SE-62-DIV | 2805 |

22442 7590 05/06/2003

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[REDACTED] EXAMINER

ECKERT II, GEORGE C

| ART UNIT | PAPER NUMBER |
|----------|--------------|
| | 2815 |

DATE MAILED: 05/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|------------------------|---------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/753,397 | JINNO ET AL. |
| | Examiner | Art Unit |
| | George C. Eckert II | 2815 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 21 February 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 7-12 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 03 January 2001 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. 08/997,763.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 23, 2002 in which claims 7-9 were amended has been entered.

Election/Restrictions

Claims 1-6 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a non-elected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 8.

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 08/997,763, filed on December 24, 1997.

Claim Rejections - 35 USC § 112

Rejection of claim 9 under 35 U.S.C. 112, second paragraph, has been overcome based on applicant's amendment.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,548,132 to Batra et al. in view of US 5,793,460 to Yang. With regard to claims 7 and 8, Batra et al. teach, with reference to figures 4-7 and the text beginning in column 5, line 62, a bottom gate thin film transistor 50 comprising:

an insulator substrate 52,
a gate electrode 54 located on the insulator substrate,
an insulator film 56/58 provided on the substrate and gate electrode, and
an active layer 60 including a polycrystalline silicon film on the insulator film where a drain 70, a source 72 and a channel 62 over the gate electrode are defined, wherein grain sizes of the drain and source are greater than a grain size of the channel (see the description of the first embodiment of Batra (col. 2, lines 1-34) which teaches that the source/drain regions alone are made amorphous and annealed such that their grain size is larger than that of the channel. Note also that while Batra shows in figs. 4-7 only the drain offset 66 having a larger grain size, it is taught in column 6, lines 8-10 that the channel region alone may be masked such that the entire source and drain regions have the larger grain size, not merely the offset region).

With regard to claims 9 and 10, Batra et al. teach that the grain size of the channel is 0.1 μm (1000 Å) which is at least about 500Å and will provide desired device characteristics such as on current. With regard to claims 11 and 12, Batra et al. did not expressly teach that the grain size of the channel were in a range of 1500 – 20,000 Å or 3000 – 10,000 Å. Because Batra et al. did teach that the grain size of the channel was approximately 1000Å, it is considered obvious that one of skill in the art would form the channel region having grain sizes in the range of 3000 – 10,000 Å. The motivation for doing so, as is taught by Batra et al., is that lager grains will have fewer grain boundaries and thus fewer dangling Si bonds which trap carriers (col. 2, lines 39–41).

Regarding claim 7, Batra did not expressly teach that the gate electrode was formed of a refractory metal. Rather, Batra teaches that the gate electrode may be formed of polysilicon (col. 4, lines 54-58). Yang teaches, with reference to column 6, lines 38-42, that a gate electrode of a thin film transistor may comprise either polysilicon or a refractory metal. Batra et al. and Yang are combinable because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to form the device of Batra using a refractory metal as the gate electrode rather than polysilicon. The motivation for doing so, as is taught by Yang, is that the use of either polysilicon or a refractory metal as a gate electrode is well known in the art and such use amounts to nothing more than a substitution of one well-known material for another. Therefore, it would have been obvious to combine Batra et al. and Yang to obtain the invention of claims 7-12.

Response to Arguments

Applicant's arguments filed December 23, 2002 have been fully considered but they are not persuasive. Applicant argues that Batra does not teach a bottom gate thin film transistor device wherein the gate is formed of a refractory metal. However, such argument is not persuasive in light of the new obviousness rejection of Batra in view of Yang. Yang teaches what is well known in the art: that either a refractory metal or polysilicon may be used as a gate electrode for a thin film transistor. As such, the arguments are not persuasive.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George C. Eckert II whose telephone number is (703) 305-2752. The examiner can normally be reached on 8:00 - 5:30, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


GEORGE ECKERT
PRIMARY EXAMINER

GCE
May 1, 2003